

Amendment and Response

Applicant: Willard Charles Raymond

Serial No.: 10/622,850

Filed: July 18, 2003

Docket No.: A126,116.102

Title: ADJUSTABLE WAFER ALIGNMENT ARM

IN THE CLAIMS

Please add claim 23

Please amend claim 1 as follows:

- 1.(Currently Amended) A film frame handling station including:
 - a load port;
 - a cassette selectively loaded upon the load port whereby the cassette has a plurality of slots for selectively maintaining one or more film frames therein;
 - a robot end effector for selectively grabbing a selected film frame from within the cassette for processing, or selectively returning a film frame after processing back to the cassette; and
 - a frame support including opposing support arms, each support arm including a first contact element and a second contact element spaced apart from the first contact element, the first and second contact elements laterally movable relative to the support arm;wherein the frame support is vertically movable across the plurality of slots of a loaded cassette for selective alignment with each of the slots, respectively.
- 2.(Original) The film frame handling station of claim 1, wherein the frame support includes a Y-shaped body.
- 3.(Previously Presented) The film frame handling station of claim 1, wherein the opposing support arms extend from a base arm of the frame support.
- 4.(Previously Presented) The film frame handling station of claim 3, wherein the first and second contact elements are disposed at a top of a respective one of the opposing support arms.

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5.(Cancelled)

6.(Previously Presented) The film frame handling station of claim 4, wherein the first and second contact elements are horizontally moveable relative to the base arm.

7.(Original) The film frame handling station of claim 6, further including at least one actuator for horizontally moving the contact elements relative to the base arm.

8.(Previously Presented) The film frame handling station of claim 1, wherein each of the first and second contact elements includes a roller.

9.(Original) The film frame handling station of claim 8, wherein each of the rollers is spring-loaded.

10.(Previously Presented) A method of handling a film frame maintaining a wafer relative to a cassette having a first slot for selectively maintaining the film frame, the method comprising:

providing a handling system including a load port, a robot end effector, and a vertically adjustable frame support having opposing support arms, each support arm including a plurality of spaced apart contact elements;

placing the cassette on to the load port;

moving the frame support in a linear, vertical fashion relative to the cassette from a first position in which the contact elements are vertically spaced from the first slot to a second position in which the contact elements are vertically aligned with the first slot;

moving the contact elements relative to a respective one of the supports arms, including:

determining a diameter of the film frame,

horizontally positioning the contact elements based upon the determined diameter;

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engaging a forward edge of the film frame with the end effector;
supporting a bottom of the film frame along an outer region thereof with the contact elements; and
moving the film frame relative to the first slot in the cassette via movement of the end effector.

11.(Cancelled)

12.(Previously Presented) The method of claim 10, wherein horizontally positioning the contact elements includes programming an actuator connected to a support otherwise maintaining the contact elements.

13.(Original) The method of claim 10, further comprising:
determining a first diameter of a first film frame;
horizontally positioning the contact elements based upon the determined first diameter;
processing the first film frame;
determining a second diameter of a second film frame, the second diameter being different from the first diameter; and
horizontally re-positioning the contact elements based upon the determined second diameter.

14.(Original) The method of claim 10, wherein moving the frame support relative to the cassette slot includes moving the film frame away from the cassette slot.

15.(Original) The method of claim 10, wherein moving the frame support relative to the cassette slot includes moving the film frame toward the cassette slot.

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16.(Original) The method of claim 10, wherein supporting a bottom of the film frame includes engaging the bottom of the film frame such that the film frame is moveable relative to the contact elements.

17.(Original) The method of claim 16, wherein each of the contact elements is a roller.

18.(Previously Presented) The film frame handling station of claim 1, wherein the first and second contact elements are vertically compliant.

19.(Previously Presented) The method of claim 10, further comprising:
vertically deflecting at least one of the plurality of contact elements during the movement of the film frame relative to the slot.

20.(Previously Presented) The method of claim 10, wherein the cassette further includes a second slot for selectively maintaining a second film frame, the method further comprising:

following moving of the film frame relative to the first slot, moving the frame support in a linear, vertical fashion relative to the cassette to a third position in which the contact elements are aligned with the second slot;

engaging a forward edge of the second film frame with the end effector; and
moving the second film frame relative to the second slot via movement of the end effector;

wherein the cassette is maintained in a fixed position on the load port during movement of the frame support from the second position to the third position.

21.(Previously Presented) The film frame handling station of claim 1, wherein at least one of the first and second contact elements is secured to a shaft that is extendably connected to a respective one of the support arms.

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22.(Previously Presented) The film frame handling station of claim 1, wherein at least one of the first and second contact elements is secured to a support plate that is pivotally mounted to a respective one of the support arms.

23.(New) The film frame handling of claim 1, further comprising:
an elevator mechanism mounted to the load mechanism and movably maintaining a base arm of the frame support, the opposing support arms extending from the base arm.